(SITE NAME)

ODOR IMPACT MINIMIZATION PLAN

Purpose/Context of the OIMP

This Odor Impact Minimization Plan (OIMP) is intended to provide guidance to on-site personnel in the handling, storage, and removal of compostable materials, in accordance with Title 14, California Code of Regulations Section 17863.4. This OIMP will be maintained on-site and revised as necessary to reflect any changes in the design or operation of this site. A copy of the revisions will be provided to the enforcement agency within 30 days of the changes. In addition, this OIMP will be reviewed annually to determine if any revisions are necessary.

This site receives *(…. specify the types, sources, and volumes of material to be processed….)*.[i] No more than *(…. maximum site capacity….)* cubic yards of feedstock, compost, or chipped and ground material is on-site at any one time. The feedstock is processed within *(…. approximate residence time in hours or days prior to processing for inclusion in a composting system or removed from the site for chipping/grinding ….)* after receipt. The compostable materials remain on-site for *(…. approximate residence time in hours or days while being processed in a composting or chipping/grinding system….)* for processing. Finished products are removed from the site within *(…. approximate residence time in hours or days prior to removal from the site….)* after processing.[ii]

I. Odor Monitoring Protocol

A. Proximity of Odor Receptors

The closest receptors are *(….list the types or groups of people that may be exposed to operational odors, e.g., site personnel, the public, material delivery drivers,….)* .

The closest off-site receptors are *(…. list the types, e.g., residential, school, hospital, with the approximate distance and direction of each….)* from the site.[iii]

B. Method for Assessing Odor Impacts

Each operating day the operator evaluates on-site odors and operations for potential release of objectionable odors.

(…. Name and describe the methods of evaluation employed at this site….)

If questionable or objectionable on-site odors are detected by site personnel, operations personnel will implement the following protocol:

1. Investigate and determine the likely source of the odor.
2. Access the effectiveness of available on-site management practices to resolve the odor event and immediately take steps to reduce the odor-generating

capacity of on-site material. (Possible on-site odor sources and management techniques for this site are shown in Table 1.)
3. Determine if the odor traveled off-site by surveying the site perimeter and noting existing wind patterns.
4. If it is determined possible odors impacts occurred, appropriate EA and/or neighbors contact is made.
5. Record the event for further operational review.

II. Meteorological Conditions (Including Seasonal Variations)

A. Wind Velocity

Historical wind data indicates prevailing wind is from the *(…. list direction(s)and velocity of prevailing wind for the site, state frequency and/or intensity of daily or other period events….)*. The most common seasonal variation (or storm event) is *(….Discuss the seasonal variations that apply to this site….)*.

B. Wind Direction

See the Wind Rose provided in *(….identify attachment….)*.

III. Complaint Response Protocol

(….Describe the procedures and/or protocol used to receive and acknowledge odor complaints that are directed at the site. If a standardize format or form is used, identify and attach a form….)[iv]

IV. Operating Procedures (and Design Concerns) to Minimize Odors

In order to minimize the development of conditions that could lead to odor problems, the compostable material handling areas of the site were designed based on the nature and quantity of materials to be received and stored, climatological factors, adjacent land use, grading, and drainage controls.

The primary sources of odors at this site occur during the *(….state the period of highest odor emissions such as receipt and initial handling period ….)*.[v] As a result, site personnel assess materials upon receipt for odor generation potential. Site personnel have been trained to manage all compostable material handling in a manner that minimizes the development of conditions that could lead to objectionable odors.

A. Aeration

(….Describe the primary method of aeration used at this site…)[vi]

B. Moisture Content of Materials and Moisture Management

Most of the material received consists of *(….list significant materials received with moisture contents above 50% and/or low moisture material used to aid in moisture management, such as variable amounts of grass clippings or clean, dry, woody*

materials….).[vii] *(….If a pile or windrow system is being used, state the desired moisture content in the material when forming the pile….)*

C. Feedstock Characteristics and Quality

The feedstock consists of *(….list the types of materials, such as green material, yard trimmings, and wood waste, as defined in 14 CCR 17852….).* Incoming materials are checked for physical contaminants, and removed contaminants are *(….discuss load checking and contamination removal….).*[viii]

D. Airborne Emission Controls

In order to reduce airborne emissions, *(….describe the controls used to address dust and odor-related emissions such as misting systems and ….).* [ix]

E. Drainage Controls

The site's drainage is *(….describe the methods used to control run-on and run-off to assure that standing water does not add to odor generation even in unusual storm events….)*

F. Pad Maintenance

(….Describe the design and maintenance of operational surfaces as to prevent accumulation of odor-generating materials….)

G. Process/wastewater Controls

(….Describe the methods used to control odor generation from process/wastewater including provisions for unusual storm events; include agreements and arrangements for off-site movement of excess process water or leachate….)

H. *Material Processing, Handling, and Storage Practices*

1. Processing

a. Feedstock

Feedstock is processed within *(….list the timing of feedstock processing including the maximum residence time of unprocessed feedstock materials….)*[x]

b. Processed Material

Material that has been placed in *(….list the timing of material processing including the maximum residence time of materials at various stages points of processing and/or indicate the average storage time/frequency used to process materials)*. .

2. Pile Geometry[xi]

a. Feedstock

(….Provide the number and dimensions of each pile, describe changes in pile configuration for special material handing if applicable ….)

b. Processed Material

(….Provide the number and dimensions of each pile, describe seasonal or weather-related adjustments in pile configuration if applicable ….)

I. *Weather Event Impacts*

(….Describe type and frequency of weather events, such as wind changes in velocity and direction, rain, thunder storms, high winds, fog, or inversions which would require adjustments in or impede processing activities. Include mitigations or reference other sections of the OIMP to address impacts of weather on material processing….)[xii]

J. *Contingency Plans*

1. Fire Prevention

(….Describe temperature monitoring and fire prevention measures employed at the site to address the migration of fire-related odors and products of combustion off-site. Include mitigations or reference other sections of the OIMP to address fire impacts on off-site receptors)[xiii]

2. Water Supply

(….List the source(s) of water for material processing and fire control)

3. Equipment

(….List the sources of contingency equipment)

4. Power

(….Describe type and load of emergency power require to maintain operators that would control or be used in the mitigation of odors….)

5. Personnel

(….Describe the contingency plan to be employed for absences of key operatiuons personnel….)

K. *Personnel Training*

(….Describe type and frequency of training provided to operators personnel. Provide the location for the records maintained on personnel training….)

L. *Biofiltration*

(….Describe the biofiltration employed if applicable….)

M. *Load Enclosure / Tarping*

(….Describe type of controls used to mitigate for odors from arriving loads….)

Table 1
Sources of Odor and Possible Management Techniques

Odor Source Location	Possible Cause	Management Approach
Feedstock Receiving	Material exceptionally odorous upon receipt	Add carbon source at grinding and “nibble” at odorous pile
	Odorous material remaining unprocessed on receiving pad (mix sitting too long prior to processing)	Augment material processing efforts
Aisles / Access Roads	Storm water allowed to pond in improperly graded areas	Absorb ponded water with wood chips/other absorbent, fill depressions, improve grading and/or drainage control
	Unprocessed material in aisles	Clean aisles of spilled material and treat with carbon source
Stockpiles / Windrows	Ammonia odor (high nitrogen level)	Add additional wood chips (or other carbon source), recombine pile
	Sulfur Odor (anaerobic conditions)	Increase turning frequency, check temperatures, add bulking agent
	Varying odors in pile	Turn windrows to achieve even mixing, check temperatures, porosity, fiber-length, bulk density, and moisture content, adjust windrow constituents, geometry, and/or configuration
	Odors generated after turning	Increase turning frequency, increase pile porosity, add odor-absorbing amendment (like wood chips, sawdust, wood ash)
	Long retention time	Remove chipped and ground material more frequently
Curing Piles / Product Storage Areas	Odors present at time of loading (temperatures above 122°F)	Decrease pile size, increase windrow time prior to moving to curing piles or product storage

[i] The operator needs to list (and consider) all feedstock received. Many compostable materials have very distinctive odor-generating properties. Descriptions that contain the type and source of the material are especially helpful, such as, "two week collection cycle, curbside green material," or "private hauler, landscraper-collected, yard trimmings," or "morning-delivered, by end-dump, 95% moisture biosolids," or "unground, grocery produce with associated packaging by walking-floor trailer."

[ii] Compostable materials used on-site for beneficial use are generally considered removed from the site.

[iii] The distribution of receptors and their relationship to surrounding land use is extremely important. The description of surrounding land uses may also assist in identifying other potential odor sources.

[iv] An odor complaint receipt procedure is an integral part of the OIMP. The information provided by the complainant can be extremely valuable to site operations personnel. A typical odor response protocol might be:

When a complaint is received, designated site personnel will:

1. Obtain time, location, and nature or characteristics of the odor and record that information to review for operational trends (see 4.).
2. If practical, proceed to the location of the complaint to verify that the site is indeed responsible for the odor. Otherwise, investigate the probable source of the odor complaint and implement operational changes to minimize odors.
3. If warranted, meet with the LEA and complainant (if known and choosing to participate) within a reasonable time frame to discuss the nature of the source of the odor and operational changes proposed and/or implemented.
4. Document the complaint(s) in the Operations/Complaint Log, including the nature of the complaint and actions taken to minimize odors in the future. Notify the LEA and other interested parties of the status of the complaint.

The use of an identified "complaint form" may help many operations with tracking and documentation of odor events. Identify the form in the OIMP and place it as an attachment if used.

[v] Emissions from compostable materials usually demonstrate their most objectionable qualities in the front end of the composting process, first two to seven days. Site operations can take advantage of this fact by adjusting handling and pile geometry in the first week, or sometimes even the first three weeks.

[vi] The most common form of aeration is passive (or convective aeration) with periodic pile agitation (or turning). In most cases the convective flow (with diffusion) provides the piled, compostable material with most of its oxygen. Many of the decomposers in the pile do fine with oxygen levels below 10%. Although forced-air systems can greatly increase the available oxygen in most systems, the challenges are many to get the air where it needs to be (as is the case with bio-filters also).

[vii] The use of handling methods specifically developed for high-moisture content materials, such as grass clippings, food wastes, or biosolids, cannot be over stressed. The identification and initial handling of these high-moisture materials can be the single most crucial step in odor impact management. There may also be significant seasonal variations in the moisture content of these materials, grass clippings being the best example. The method by which moisture is added to feedstock as it is chipped and ground may play an important role also. Particle coating is the goal, as opposed to a measurable 50-60% overall moisture content.

[viii] The benefits from adequate load-checking are many. Language such as, "All incoming feedstock is checked for physical contaminants. A spotter is on-site during operating hours," might be sufficient for many operations. See note vii, also.

[ix] Misting/spray systems can provide effective control of dust and water-soluble, odor-causing compounds. Water may be introduced with sprays in great enough quantities to increase the overall moisture content, but misting systems do not add significant moisture when used during the chipping/grinding and screening processes.

[x] Again the receipt/initial handling of materials presents an opportunity to address odor. Some materials may require immediate mixing with high carbon, relatively dry, woody material or even stockpiled odor – trapping ash. Pile temperatures of heterogeneous materials should be monitored to prevent fires in the feedstock storage areas. (See also note vii and xiii)

[xi] Pile geometry has a direct impact on convective aeration and therefore odor-generating potential. In general, smaller, steeper piles have better convective characteristics.

[xii] Weather-related operational changes must be considered by most operations. If wind direction or meteorological conditions may cause off-site odors, operations personnel should implement an operations adjustment. A typical protocol may include the following:

1. Stop all operations that will cause off-site odor.
2. Determine if on-site management practices may remedy any odor problems and immediately take steps to remedy the situation.
3. Determine whether or not the odor is traveling beyond the site by patrolling the site perimeter. Do not start operations again until the wind and meteorological conditions are favorable and will not promote off-site odors
4. Determine whether or not the odor has moved off-site and if so, if it is significant enough to warrant contacting the adjacent neighbors and/or the LEA.

Maintenance of operational areas for spreading and/or temporary storage may be necessary for some operations during adverse weather conditions.

[xiii] As fires and resulting products of combustion may cause off-site odors, temperatures of high-risk piles should be monitored daily. Ample areas for spreading and wetting of burning materials should be maintained adjacent to feedstock receipt and initial chipping/grinding areas.